

Fig.S1 (A) Hemoglobin assay for detecting CAL-catalyzed CO under different irradiation intensity, and (B) corresponding CO yield, under 5 min 660 nm irradiation, $n = 3$.

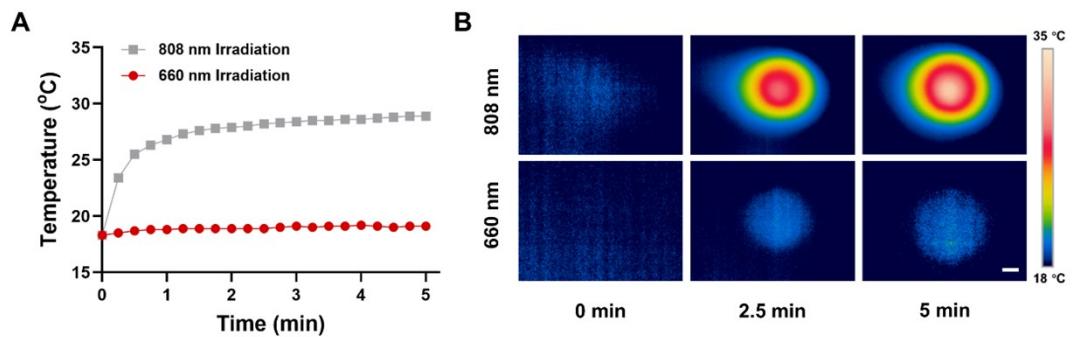


Fig.S2 (A) Temperature curves of CAL upon 808 nm and 660 nm laser irradiation (400 mW/cm²), and (B) representative infrared thermal images at 0, 2.5, 5 min (scale bar: 1 mm).

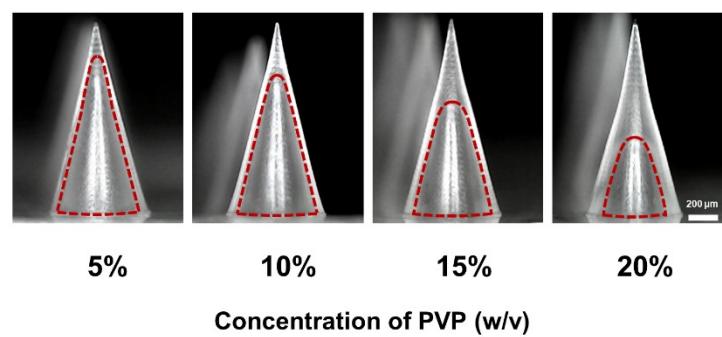


Fig.S3 Representative MNs with micro-cavities, fabricated with different concentrations of PVP (5–20%, w/v).

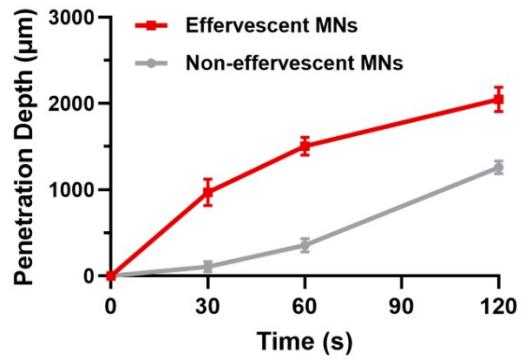


Fig.S4 Corresponding penetration depth of Dox·HCl at different time points by effervescent and non-effervescent MNs penetrating hydrogen model, $n = 4$.

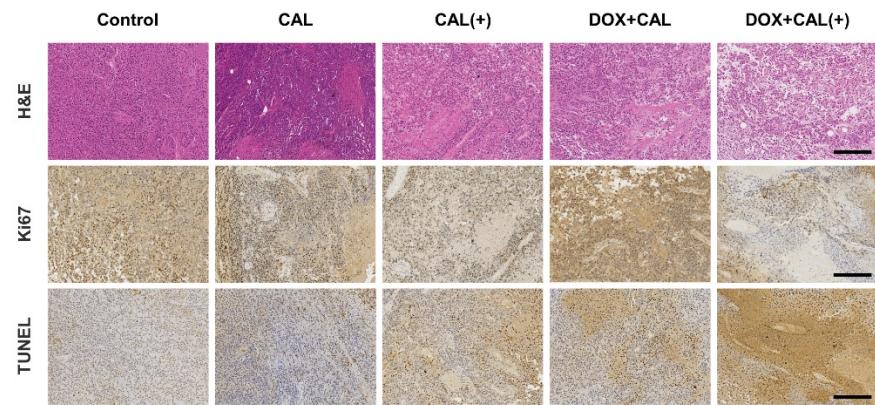


Fig.S5 Representative images of H&E, Ki67, and TUNEL stained tumor tissues isolated from the B16F10-bearing nude mice (scale bar: 200 μ m).

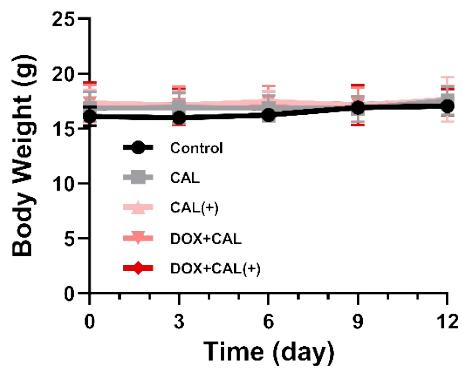


Fig.S6 Body weight changes of nude mice during the treatments.